Turtles all the way down

"**Turtles all the way down**" is an expression of the problem of infinite regress. The saying alludes to the mythological idea of a World Turtle that supports a flat Earth on its back. It suggests that this turtle rests on the back of an even larger turtle, which itself is part of a column of increasingly larger turtles that continues indefinitely.

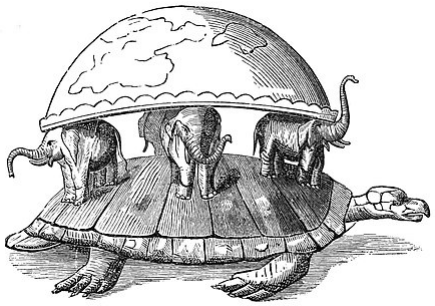
The saying holds that the world is supported by an infinite stack of increasingly large turtles. Beneath each turtle is yet another, unlike this image, which shows only three turtles.

The exact origin of the phrase is uncertain. In the form "rocks all the way down", the saying appears as early as 1838.[1] References to the saying's mythological antecedents, the World Turtle and its counterpart the World Elephant, were made by a number of authors in the 17th and 18th centuries.[2][3]

The expression has been used to illustrate problems such as the regress argument in epistemology.

History

Background in Hindu mythology



Four World Elephants resting on a World Turtle

Early variants of the saying do not always have explicit references to infinite regression (i.e., the phrase "all the way

down"). They often reference stories featuring a World Elephant, World Turtle, or other similar creatures that are claimed to come from Hindu mythology. The first known reference to a Hindu source is found in a letter by Jesuit Emanuel da Veiga (1549–1605), written at Chandagiri on 18 September 1599, in which the relevant passage reads:

Alii dicebant terram novem constare angulis, quibus cœlo innititur. Alius ab his dissentiens volebat terram septem elephantis fulciri, elephantes uero ne subsiderent, super testudine pedes fixos habere. Quærenti quis testudinis corpus

Others hold that the earth has nine corners by which the heavens are supported. Another disagreeing from these would have the earth supported by seven elephants, and the elephants do not sink down because their feet are fixed on a tortoise. When asked who would

firmaret, ne dilaberetur, respondere nesciuit.	fix the body of the tortoise, so that it would not collapse, he said that he did not know.[4]

Veiga's account seems to have been received by Samuel Purchas, who has a close paraphrase in his *Purchas His Pilgrims* (1613/1626), "that the Earth had nine corners, whereby it was borne up by the Heaven. Others dissented, and said, that the Earth was borne up by seven Elephants; the Elephants' feet stood on Tortoises, and they were borne by they know not what."[5] Purchas' account is

again reflected by John Locke in his 1689 tract *An Essay Concerning Human Understanding*, where Locke introduces the story as a trope referring to the problem of induction in philosophical debate. Locke compares one who would say that properties inhere in "Substance" to the Indian who said the world was on an elephant which was on a tortoise, "But being again pressed to know what gave support to the broad-back'd Tortoise, replied, something, he knew not what".[2] The story is also referenced by Henry David Thoreau, who writes in his journal entry of 4 May 1852: "Men are making speeches ... all over the country, but each

expresses only the thought, or the want of thought, of the multitude. No man stands on truth. They are merely banded together as usual, one leaning on another and all together on nothing; as the Hindoos made the world rest on an elephant, and the elephant on a tortoise, and had nothing to put under the tortoise."[6]

Modern form

In the form of "rocks all the way down", the saying dates to at least 1838, when it was printed in an unsigned anecdote in the *New-York Mirror* about a schoolboy and an old woman living in the woods:

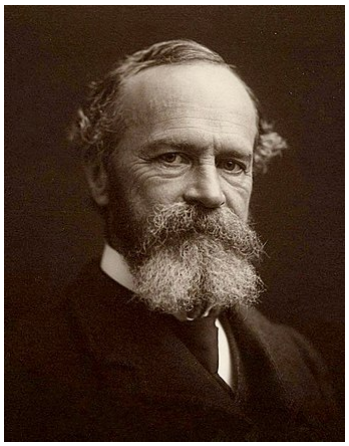
"The world, marm," said I, anxious to display my acquired knowledge, "is not exactly round, but resembles in shape a flattened orange; and it turns on its axis once in twenty-four hours."

"Well, I don't know anything about its axes," replied she, "but I know it don't turn round, for if it did we'd be all tumbled off; and as to its being round, any one can see it's a square piece of ground, standing on a rock!"

> *"Standing on a rock! but upon what does that stand?"*
>
> *"Why, on another, to be sure!"*
>
> *"But what supports the last?"*
>
> *"Lud! child, how stupid you are! There's rocks all the way down!"*[1]

A version of the saying in its "turtle" form appeared in an 1854 transcript of remarks by preacher Joseph Frederick Berg addressed to Joseph Barker:

> *My opponent's reasoning reminds me of the heathen, who, being asked on what the world stood, replied, "On a tortoise." But on what does the tortoise stand? "On another tortoise." With Mr. Barker, too, there are tortoises all the way down. (Vehement and vociferous applause.)*
>
> — *"Second Evening: Remarks of Rev. Dr. Berg"*[7]



William James

Many 20th-century attributions claim that philosopher and psychologist William James is the source of the phrase.[8] James referred to the fable of the elephant and tortoise several times, but told the infinite regress story with "rocks all the way down" in his 1882 essay, "Rationality, Activity and Faith":

> *Like the old woman in the story who described the world as resting on a rock, and then explained that rock to be supported by another rock, and finally when pushed with questions said it was "rocks all the way down," he who believes this to be a radically moral universe must hold the moral order to rest either on an absolute and ultimate should or on a series of shoulds "all the way down."*[9]

The linguist John R. Ross also associates James with the phrase:

> *The following anecdote is told of William James. [...] After a lecture on cosmology and the structure of the solar system, James was accosted by a little old lady.*
>
> *"Your theory that the sun is the centre of the solar system, and the earth is a ball which rotates around it has a very convincing ring to it, Mr. James, but it's*

wrong. I've got a better theory," said the little old lady.

"And what is that, madam?" inquired James politely.

"That we live on a crust of earth which is on the back of a giant turtle."

Not wishing to demolish this absurd little theory by bringing to bear the masses of scientific evidence he had at his command, James decided to

gently dissuade his opponent by making her see some of the inadequacies of her position.

"If your theory is correct, madam," he asked, "what does this turtle stand on?"

"You're a very clever man, Mr. James, and that's a very good question," replied the little old lady, "but I have an answer to it. And it's this: The first turtle stands on the back of a second,

> *far larger, turtle, who stands directly under him."*
>
> *"But what does this second turtle stand on?" persisted James patiently.*
>
> *To this, the little old lady crowed triumphantly,*
>
> *"It's no use, Mr. James—it's turtles all the way down."*
>
> *—J. R. Ross, Constraints on Variables in Syntax, 1967*[10]

Turtle world, infinite regress and explanatory failure

The mythological idea of a *turtle world* is often used as an illustration of infinite regresses. An *infinite regress* is an infinite series of entities governed by a recursive principle that determines how each entity in the series depends on or is produced by its predecessor.[11] The main interest in *infinite regresses* is due to their role in *infinite regress arguments*. An *infinite regress argument* is an argument against a theory based on the fact that this theory leads to an infinite regress.[11][12] For such an argument to be successful, it has to

demonstrate not just that the theory in question entails an infinite regress but also that this regress is vicious.[11][13] There are different ways in which a regress can be vicious.[13][14] The idea of a *turtle world* exemplifies viciousness due to *explanatory failure*: it does not solve the problem it was formulated to solve. Instead, it assumes already in disguised form what it was supposed to explain.[13][14] This is akin to the informal fallacy of begging the question.[15] In one interpretation, the goal of positing the existence of a world turtle is to explain why the earth seems to be at rest instead of falling down: because it rests on the

back of a giant turtle. In order to explain why the turtle itself is not in free fall, another, even bigger turtle is posited, and so on, resulting in a world that is *turtles all the way down*.[13][11] Despite its shortcomings in clashing with modern physics, and due to its ontological extravagance, this theory seems to be metaphysically possible, assuming that space is infinite, thereby avoiding an outright contradiction. But it fails because it has to assume rather than explain at each step that there is another thing that is not falling. It does not explain why nothing at all is falling.[11][13]

In epistemology and other disciplines

The metaphor is used as an example of the problem of infinite regress in epistemology to show that there is a necessary foundation to knowledge, as written by Johann Gottlieb Fichte in 1794:[16]

> *If there is not to be any (system of human knowledge dependent upon an absolute first principle) two cases are only possible. Either there is no immediate*

certainty at all, and then our knowledge forms many series or one infinite series, wherein each theorem is derived from a higher one, and this again from a higher one, etc., etc. We build our houses on the earth, the earth rests on an elephant, the elephant on a tortoise, the tortoise again—who knows on what?—and so on ad infinitum. True, if our knowledge is thus constituted, we can not alter it; but neither have we, then, any

> *firm knowledge. We may have gone back to a certain link of our series, and have found every thing firm up to this link; but who can guarantee us that, if we go further back, we may not find it ungrounded, and shall thus have to abandon it? Our certainty is only assumed, and we can never be sure of it for a single following day.*

David Hume references the story in his *Dialogues Concerning Natural Religion*

when arguing against God as an unmoved mover:[3]

> *How, therefore, shall we satisfy ourselves concerning the cause of that Being whom you suppose the Author of Nature, or, according to your system of Anthropomorphism, the ideal world, into which you trace the material? Have we not the same reason to trace that ideal world into another ideal world, or new intelligent principle? But if we stop, and go no further; why go*

so far? why not stop at the material world? How can we satisfy ourselves without going on in infinitum? And, after all, what satisfaction is there in that infinite progression? Let us remember the story of the Indian philosopher and his elephant. It was never more applicable than to the present subject. If the material world rests upon a similar ideal world, this ideal world must rest upon some other; and so on, without

end. It were better, therefore, never to look beyond the present material world. By supposing it to contain the principle of its order within itself, we really assert it to be God; and the sooner we arrive at that Divine Being, so much the better. When you go one step beyond the mundane system, you only excite an inquisitive humour which it is impossible ever to satisfy.

Bertrand Russell also mentions the story in his 1927 lecture *Why I Am Not a Christian* while discounting the First Cause argument intended to be a proof of God's existence:

> *If everything must have a cause, then God must have a cause. If there can be anything without a cause, it may just as well be the world as God, so that there cannot be any validity in that argument. It is exactly of the same nature as the Hindu's view, that the world rested upon*

> *an elephant and the elephant rested upon a tortoise; and when they said, 'How about the tortoise?' the Indian said, 'Suppose we change the subject.'*

Modern allusions or variations

References to "turtles all the way down" have been made in a variety of modern contexts. For example, American hardcore band Every Time I Die titled a song “Turtles All the Way Down” on their 2009 album “New Junk Aesthetic”. The lyrics mention the turtle world theory.

"Turtles All the Way Down" is the name of a song by country artist Sturgill Simpson that appears on his 2014 album *Metamodern Sounds in Country Music*.[17] "Gamma Goblins ('Its Turtles All The Way Down' Mix)" is a remix by Ott for the 2002 Hallucinogen album *In Dub*.[18] *Turtles All the Way Down* is also the title of a 2017 novel by John Green about a teenage girl with obsessive–compulsive disorder.[19]

Stephen Hawking incorporates the saying into the beginning of his 1988 book *A Brief History of Time*:[20]

A well-known scientist (some say it was Bertrand Russell) once gave a public lecture on astronomy. He described how the earth orbits around the sun and how the sun, in turn, orbits around the centre of a vast collection of stars called our galaxy. At the end of the lecture, a little old lady at the back of the room got up and said: "What you have told us is rubbish. The world is really a flat plate supported on the back of a giant

> *tortoise." The scientist gave a superior smile before replying, "What is the tortoise standing on?" "You're very clever, young man, very clever," said the old lady. "But it's turtles all the way down!"*

Former U.S. Supreme Court Justice Antonin Scalia discussed his "favored version" of the saying in a footnote to his plurality opinion in *Rapanos v. United States*:[21]

> *In our favored version, an Eastern guru affirms that the earth is supported on the back of a tiger. When asked what supports the tiger, he says it stands upon an elephant; and when asked what supports the elephant he says it is a giant turtle. When asked, finally, what supports the giant turtle, he is briefly taken aback, but quickly replies "Ah, after that it is turtles all the way down."*

Microsoft Visual Studio had a gamification plug-in that awarded badges for certain programming behaviors and patterns. One of the badges was "Turtles All the Way Down", which was awarded for writing a class with 10 or more levels of inheritance.[22]

American rock band mewithoutYou titled a song "Tortoises All the Way Down," as a play on this image, on their 2018 album *[Untitled]*.

In Terry Pratchett's *Discworld*, the titular flat planet is balanced on the backs of four elephants which in turn stand on the back

of a giant turtle, while a small star orbits the assembly. The question of what the turtle stands on is acknowledged and dismissed: the turtle doesn't stand on anything; it swims through space.

In a TED-Ed video discussing Gödel's incompleteness theorems, the phrase "Gödels all the way down" is used to describe the way in which one can never get rid of unprovable true statements in an axiomatic system.

In the incremental game *Cookie Clicker*, a player can earn the achievement "Cookies

all the way down" by baking over 100 sextillion cookies.

See also

- Axiom of foundation – Axiom of set theory
- Cartesian theater – Philosophical term denoting the supposed terminus between mind and body
- Chicken or the egg – Philosophical paradox
- Cosmological argument – Argument for the existence of God
- Discworld – Fantasy book series by Terry Pratchett

- God of the gaps – Theological argument
- Homunculus argument – Informal fallacy
- Kurma – Tortoise form of the Hindu god Vishnu
- Matryoshka doll – Russian nested wooden toy
- Münchhausen trilemma – A thought experiment used to demonstrate the impossibility of proving any truth
- Primum Mobile – Outermost moving sphere in the geocentric model of the universe
- Primum movens – Postulated primary cause of all activity in the universe

- Problem of the creator of God – Philosophical problem
- Pyrrhonism – Ancient Greek school of philosophical skepticism
- *The Siphonaptera* – 1872 rhyme by Augustus De Morgan
- Teleological argument – Argument for the existence of God
- Transfinite induction – Mathematical concept
- Turtle Island (Native American folklore) – Name for Earth or North America used by Indigenous peoples in Canada and the United States

- World Turtle – Giant turtle supporting or containing the world
- *Yertle the Turtle and Other Stories* – 1958 picture book collection by Dr. Seuss

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Notes

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